

Montana State Legislature

Senate Testimony Interim Committee on Energy

September 22, 2005

MontanaTech

ENERGY & TELECOMMUNICATIONS
INTERIM COMMITTEE
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Exhibit 17

Current programs with direct or indirect energy impacts and potential for economic development in Montana

**Titanium Extraction Mining and Process Engineering Research
(TEMPER)**

Dr. Corby Anderson, CAMP

Program is designed to reduce energy consumption and cost in the production of Titanium. Collaborators include the US Army and Montana and Arizona based companies. Program scope is \$24,000,000.

Load Control for Reliable and Efficient Electric Energy

Dr. Daniel Trudnowski, General Engineering

Program will develop more efficient and robust ways to use the current electric power distribution grid. Partners include the Pacific Northwest Laboratory, the National Energy Technology Laboratory and MSE. Program scope is \$9,000,000.

Landfill gas utilization and Recovery

Dr. Butch Gerbrandt, General Engineering

Program will develop the technology to produce, harvest and transport gas from municipal landfills for commercial use. Partners include the University of Montana and several companies. Program scope is \$5,000,000 to \$10,000,000.

TITANIUM EXTRACTION MINING AND PROCESS ENGINEERING RESEARCH (TEMPER)



National Need

The 120 mm mortar 70 pounds lighter with titanium fasteners.

As the United States Army begins its task of transformation, titanium will become increasingly important to the Army's objective of meeting transportability, maneuverability and survivability requirements. The Army requires inexpensive and readily available titanium and is currently using the metal in its designs for

Future Combat Systems (MRAAS, RAM, and others).

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An initiative with the US Army has begun that addresses the cost of extraction and mining which, when coupled with other ongoing titanium processing technology efforts, will make titanium available at the lowest cost for current and future weapons and munitions programs. The result will be a titanium product that meets Army needs at an affordable cost and that will have a wider commercial application in the chemical processing, energy, and automotive industries, all of which are anxiously anticipating an inexpensive titanium product.

Program Objectives

The goal of the TEMPER program is to produce low-cost titanium metal that will directly benefit the United States military and commercial applications. This will be accomplished by identifying and developing new extraction and mining process technologies that will significantly reduce the cost of titanium. Emphasis will be placed on extraction and mining technologies that enhance the use of domestic titanium ore deposits, thus reducing the country's reliance on foreign titanium ore. The TEMPER program will result in a titanium processing facility developed in conjunction with the Center for Advanced Mineral and Metallurgical Processing located at Montana Tech of the University of Montana. The processing facility will be designed to use Montana titanium ore.

Montana Impact.

Eastern Montana has been identified as a site for further exploration for Titanium deposits. Processing technology and plant prototypes would be constructed in Butte. Program scope is \$24,000,000.

LOAD CONTROL FOR RELIABLE AND EFFICIENT ELECTRIC ENERGY

National Need

The United States government and industry collaborations have made great strides in improving energy efficiency over the past decade. For example, the Energy Star® program is viewed by virtually all stakeholders as a great success. Within this research area however, government spending continues to target the efficiency of individual appliances and buildings while ignoring the potentially significant benefits associated with the overall energy system considerations.



Program Objectives

The technology research, development, and demonstration program is aimed at applying advancements in intelligent distributed control methodologies and information technology to the challenges of load control with aims of improved reliability of existing T&D resources, load leveling of limited energy resources, and improved efficiency among systems of loads on a common distribution system. Montana Tech and our partners, the Pacific Northwest Laboratory, the National Energy Technology Laboratory and MSE, expect that the program will i) unequivocally demonstrate the efficacy of the approach through computer modeling and actual field trials, ii) foster the creation of energy-oriented businesses in Montana and the Northwest, iii) address uncertainty in the adequacy of the nation's energy resources, iv) leverage recent advancements in information technology that have enabled productivity gains in other sectors of the economy, and v) educate the next generation of engineers in intelligent utilization and operation of electrical energy systems.

Montana Impact.

Prototype device development may lead to local manufacturing capabilities being developed. System wide test may be performed in Butte. Program scope is \$9,000,000.

Landfill Gas (LFG) Recoverability and Utilization Project

National Need

Industry and government are investigating and implementing energy technologies and strategies for responsible energy development and conservation while protecting and improving our environment through reduction of greenhouse gases. Historically, landfill development and operations have been focused on maximizing disposal and have considered the production of landfill gas, which contains methane as a negative to operations and a cost penalty to the operator if EPA requires capture and disposal of the produced gas. However, with the increase in the cost of natural gas, decreases in supplies, and problems in distribution, methane from landfill gas has become a marketable commodity.



Landfill Gas Recoverability and Utilization Program

The purpose of this effort is to establish a Montana-based Landfill Gas Recoverability and Utilization Program designed to test and deploy innovative technology for the recovery and utilization of landfill gases in Montana and other Western Regional states. The Missoula Landfill, which is one of six primary sites in Montana, may provide an opportunity for developing natural gas (methane) production from landfill gas. The University of Montana is interested in becoming a consumer for the gas produced.

Montana Tech, MSE Technology Applications, Inc., of Butte, Montana, and the EG&G Office in Morgantown, WV, have developed a teaming relationship for the purpose of demonstrating the benefits of this innovative technology for the recovery of landfill gases in Montana.

Montana Impact

Several Montana landfill sites have been examined by EPA's Landfill Methane Outreach Program (LMOP) and determined to offer the potential for project development. The initial project demonstration would be sited at the Missoula Landfill in Missoula, Montana. Montana projects statewide, as targeted by EPA's Landfill Methane Outreach Program (LMOP), include: Missoula Landfill (Missoula), High Plains Disposal Landfill (Great Falls), Flathead County Solid Waste District Central Landfill (Kalispell), City of Bozeman Landfill (Bozeman), Billings Regional Landfill (Billings), and Butte Silver Bow Landfill (Butte). Program management would be conducted in Butte, Montana. Program scope is estimated between \$5,000,000 and \$10,000,000.

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